Remarks

Claims 1-25 were pending in the application. Claims 1-25 were rejected. No claims were merely objected to and no claims were allowed. By the foregoing amendment, claims 24&25 are canceled, claims 1, 7, 11, 14, and 19 are amended, and claim 26 and 27 added. No new matter is presented.

Claim Rejections-35 U.S.C. 102

Claims 1-5, 7, 10-16, 19, 21, 22, 24, and 25 were rejected as being anticipated by Bergmann et al. (US4992153). Applicants respectfully traverse the rejection.

Bergmann et al. identifies a "sputter-CVD process" and distinguishes this from a PVD process. Col. 1, lines 36-39. An evaporation crucible 9 contains titanium 17. The oddly-worded first paragraph of page 3 asserted that the evaporation crucible itself was the one or more first components. The meaning is unclear and insufficiently articulated. As is discussed further below, it appears to make sense to apply the titanium against the present first components of claim 1. Electron beam 30 is "guided onto the material 17 to be evaporated." Col. 3, lines 21-23. A tungsten carbide sputter target 31 acts "as cathode, which is atomized during sputtering." Col. 3, lines 35&36. Codeposition appears to occur in the middle of three stages: first a titanium layer; then the codeposited mixed layer; and finally a tungsten carbide/carbon layer.

Claim 1 has been amended to identify that ions of the first components are used to sputter the second components. Similar amendments have been made to the other independent claims. This is supported, *inter alia*, by claims 24 and 25 (now canceled), page 17, lines 23-30, and page 18, lines 17-19 of the original US application. Bergmann et al. does not suggest this. Rather, sputtering is via ions of gas introduced to the chamber. As is discussed further below, this distinction highlights several other dependent claim elements.

Regarding various element in claims 24 and 25, the Office action confusingly asserted:

> Argon ions are well known to be associated with sputtering. Bergmann et al further states that a mixed layer of titanium evaporated by means of the electron beam [30] and ionized by the low-voltage arc jointly with the sputtered tungsten produced from the acetylene gas by a plasma-chemical reaction (col. 5, lines 26-34). Since there is no partition between the evaporation crucible [9] and the sputter target [31], it is expected that the ionized argon ions would diffuse to the sputter target area, thus being mixed with the acetylene gas. Therefore as the acetylene gas sputters the metal, the argon ions mixed in would also sputter the

> metal. Thus ions of the evaporation crucible (i.e. first component) [9] are used to sputter the sputter target (i.e. second component) [31].

Office action, pages 7&8.

The nature of the asserted rejection is confusing and unclear. In no event has it been established that ions of the first material first components are used to sputter the second components. The asserted sputtering via argon does not amount to sputtering via the first components because argon is not deposited as said first material. The "evaporation crucible 9" contains titanium. Col. 4, line 57&58. Titanium would properly be applied against the claim 1 first components. The Office action has not stated that some sort of incidental migration of a small number of titanium ions are being applied as the claimed ions of the first components being used to sputter the second components. Even if so, the incidental migration of an apparently trivial and non-effective amount of titanium to the sputter target would not be anticipatory. *See, e.g., In re Ratigan*, 64 USPQ 567, 568-9 (C.C.P.A. 1945) ("[A]ccidental seepage" did not "furnish interconnection between the conduit and the oil passage in general around the packing."). *See, also, Ex parte Hartmann*, 186 USPQ 366, 367 (Bd. Pat. App. & Int. 1974) ("We believe that the routineer would construe 'partial drawing' to mean an intentional, positive act over and above any incidental elongation arising out of normal handling of the filaments."). In view of the foregoing unclarity of the action, new claim 26 identifies the subject ions as titanium ions.

New claim 27 identifies chamber pressure less than 0.01Pa and is supported by paragraph 0053. This distinguishes the vacuum or near vacuum condition of deposition from the Bergmann et al. deposition occurring via one or more external gas flows.

Regarding claim 3, the citation is a total vitiation of the reference to encircling. The Office action merely asserted:

> it is expected that part of said material (i.e. an ion flowpath) will cross into the sputter ion path by diffusion principles. Thus, the sputtering target encircles an ion flowpath from the evaporation crucible.

Office action, page 3.

This is a clear vitiation of the encircling element. It is unreasonable, and contrary to how the element would be interpreted by one of ordinary skill in the art. Effectively, this unreasonable interpretation indicates that any even remote positioning is not merely along the flowpath but encircling it. The proximity to the flowpath is, as noted above, relevant to the use of

the ions of the first material to sputter the second material.

Regarding claim 7, it was asserted that the argon ions "knock out material lying at the surface [57] (col. 4, lines 46-50), thus the workpiece has lost material from a site." Office action, page 4, lines 3-5. Again, this is a clear vitiation and unreasonable interpretation. By the foregoing amendment, a yet further preclusion of this interpretation has been added.

Regarding claim 10, the Office action engages in pure bootstrapping asserting that because Bergmann et al. references titanium and titanium is turbine engine parts, Bergmann et al. discloses depositing on Ti alloy turbine engine parts.

Regarding claim 11, there has been no application of 35 U.S.C. 112(6) as is required by *In re Donaldson*. For example, there has been no comparison of the structure of Bergmann et al. to the structure disclosed in the present application for the various 112(6) elements. However, as amended, claim 11 further distinguishes Bergmann et al. as noted above relative to claim 1.

There is no support for the assertions relative to claim 12 which, nevertheless, do not cure the deficiency of the underlying rejection of claim 11 including the failure to apply 112(6). Similar considerations attend claim 13.

Regarding amended claim 14, the rejection is overcome for the same reasons as noted above relative to claim 1.

Regarding claim 15, no support has been cited for the presence of aluminum or vanadium at all, let alone in the claimed combination.

Regarding claim 16, the assertions even if correct do not cure the deficiencies of the underlying rejection of claim 14.

Regarding amended claim 19, the rejection is overcome for the same reasons noted above relative to claim 1.

Regarding claims 21 and 22, the assertions at the first full paragraph of claim 7 are clearly insufficient and apparently unreasonable. These relate to the flowpath issues discussed above. For example, the Office action does not actually identify (e.g., via a drawing mark-up) the flowpath and the respective upstream direction and downstream direction. The apparent reference to the bottom face of the target has not been established as facing upstream and away from the flowpath.

Claim 1 was rejected as being anticipated by Zabinski et al. (USH001933). Applicants

respectfully traverse the rejection.

Zabinski et al. discloses a system having a sputtering source 21. Zabinski et al. also includes a target 28 ablated by a laser beam. Long overlapping lists of materials are respectively identified for the source 21 and target 28. Col. 3, line 57, *et seq*. identifies a simultaneous deposition mode. In view of the foregoing amendment incorporating claim 24 into claim 1, the rejection is moot.

Claim Rejections-35 U.S.C. 103

Claim 6 was rejected under 35 U.S.C. 103(a) as being unpatentable over Zabinski et al. and further in view of Lederich et al. (US4415375). Applicants respectfully traverse the rejection.

Lederich et al. merely discloses various titanium alloys. A first alloy is formed by conventional means. The composition is then altered "by heating the base titanium or titanium alloy under pressure in a non-flammable atmosphere containing hydrogen" to add hydrogen to the composition. "The alloys containing hydrogen may be formed [(i.e., re-shaped)] by superplastic forming techniques." Then, the hydrogen is removed to restore the composition. Disks were referenced apparently as being test specimens for this process. There is no suggestion to use the disk as a target. In the third and fourth paragraphs of page 9, the Office action engages in an improper bootstrapping. Paragraphs 3 and 4 referenced the Ti-8Al-1Mo-1V alloy and asserted:

> ...Lederich et al cites the advantage of this alloy as parts and structures formed and restored from said alloy retain the strength and structural integrity of the base alloy.
>
> It would have been obvious to one of ordinary skill in the art to use form a transient titanium alloy of Lederich et al from the deposition materials in Zabinski et al to gain the advantages of retention of base alloy strength and structural integrity.

Common sense indicates the opposite. An advantage of the basic alloy asserted by Lederich et al. cannot constitute a specific suggestion to use a newly hypothesized manufacturing technique for such material over conventional known techniques. Furthermore, Lederich et al.'s advantages clearly relate to formation of a substrate rather than formation of a coating. This does not suggest what composition coating of Zabinski et al. should have, let alone

exactly how it be prepared.

Nevertheless, in view of the foregoing amendment, the rejection is believed moot.

Claim 8 was rejected under 35 U.S.C. 103(a) as being unpatentable over Bergmann et al. and further in view of Ray et al. (US6986381). Applicants respectfully traverse the rejection.

Ray et al. involves the fabrication of molds for titanium castings. At the first paragraph of page 10, the Office action asserted a yield strength of Ray et al. materials as being a bond strength. This is pure bootstrapping. There is no bond between a substrate and coating asserted. The Office action then asserted that it would have been obvious "to apply the refractory metal alloy properties taught in Ray et al for Bergmann et al to gain the advantages of a superior hard and wear resistant coating." Office action, page 10, second paragraph. First, the nature of the combination has not been sufficiently specifically articulated. For example, exactly what is being replaced in Bergmann et al. and why? What is being preserved in Bergmann et al. (e.g., is the substrate being preserved?). The Office action has not even articulated what the substrate of Bergmann et al. is and why it has a coating. How does one "apply... properties"? Without such an identification, how can one identify an expectation of success, the absence of defeating any other advantages/properties of Bergmann et al., etc.?

The third paragraph of page 10 in citing *In re Wertheim* is unexplained. What ranges are asserted as overlapping? It appears that there has merely been a hindsight reconstruction via keyword search regarding a stress/pressure magnitude. Even worse, the reconstruction is merely a reconstruction of words rather than articulating how an actual product or process would be implemented with an expectation of success, etc.

Nevertheless, in view of the foregoing amendment, the rejection is believed moot.

Claim 9 was rejected under 35 U.S.C. 103(a) as being unpatentable over Bergmann et al. and Ray et al. and further in view of Gabriele et al. (US6875318) Applicants respectfully traverse the rejection.

Gabriele et al. appears to involve polymer coating of stainless steel. Where is the relevance? What is the nature of the combination (e.g., what elements are taken from Gabriele et al., how are they incorporated, what other changes are made)? Where is the expectation of success?

The assertion in the second full paragraph of page 11 of analogy between the references is misdirected. As noted above, clearly different coatings are involved for different purposes. Merely because both references have extensive lists of possible coating components that might overlap does not establish analogy.

Nevertheless, in view of the foregoing amendment, the rejection is believed moot.

Claim 17 was rejected under 35 U.S.C. 103(a) as being unpatentable over Bergmann et al. and further in view of Gruen (US5015493). Applicants respectfully traverse the rejection.

Gruen was apparently cited for the bias voltages of claim 17. It was asserted as obvious to substitute the modulated voltage "of Gruen for the DC power supply of Bergmann et al to gain the advantage making it possible to coat surface structures of workpieces having slots and bores." Office action, page 13, first paragraph. No substantiation was made that Bergmann et al. had such slots and bores and required such modification.

Nevertheless, in view of the foregoing amendment, the rejection is believed moot.

Claims 18 and 20 were rejected under 35 U.S.C. 103(a) as being unpatentable over Bergmann et al. and further in view of Nulman et al. (US6231725). Applicants respectfully traverse the rejection.

Nulman et al. involves sputtering in the fabrication of semiconductor devices. Col. 1, line 9. Nulman et al. was cited for the presence of two targets 110, 500. It was asserted as obvious to use multiple targets and bias voltages of "Nulman et al for the sputter device of Bergmann et al to gain the advantage of increased deposition uniformity." Office action, pages 13-14. This, again, is conclusory. Insufficient analogy has been demonstrated between Bergman et al. and Nulman et al. What is the nature of the combination? For example, what are the two different materials and voltages of the different targets? It has not been demonstrated that one of ordinary skill in the Bergmann et al. art would have found a deficiency and sought Nulman et al. as the cure, let alone with an expectation of success.

Nevertheless, in view of the foregoing amendment, the rejection is believed moot.

Claim 23 was rejected under 35 U.S.C. 103(a) as being unpatentable over Bergmann et al. and further in view of Nulman et al. Applicants respectfully traverse the rejection.

This rejection suffers the same deficiencies as does the claim 18&20 rejection above and does the underlying Bergmann et al. rejection. The final paragraph of page 14 highlights the lack of clarity and articulation. It asserts that it would have been obvious "to stack multiple compositional sputter targets taught in Nulman et al inside the sputter target sleeve in Bergmann et al to gain the advantage of increased deposition uniformity." What target sleeve? How are they stacked? At least, for example, a marked-up drawing of Bergmann et al. showing the hypothesized modification is necessary to sufficiently articulate the nature of the combination.

Nevertheless, in view of the foregoing amendment, the rejection is believed moot.

Accordingly, Applicants submit that claims 1-23 and 26 and 27 are in condition for allowance. Reconsideration and further examination are requested. Please charge any fees or deficiency or credit any overpayment to our Deposit Account of record.

Respectfully submitted,

By /William B. Slate, #37238/
William B. Slate
Attorney for Applicant
Reg. No.: 37,238

Telephone: 203-777-6628
Telefax: 203-865-0297

Date: April 30, 2008